



FIBER OPTIC AMPLIFIER

Abstract of the Invention

An amplifier for use with fiber optic systems comprises a neodymium YAG crystal placed in series with a
5 signal-carrying optical fiber. The ND:YAG crystal is supplied by the optical fiber with both the signal to be amplified, and pumping illumination. The pumping illumination is coupled onto the optical fiber by a multiplexing coupler which is used to combine the signal
10 to be amplified and illumination from a pumping illumination source onto a single optical fiber. The pumping illumination inverts the neodymium ions within the ND:YAG crystal. The signal to be amplified propagates through this crystal to stimulate emission of coherent
15 light from the neodymium ions, resulting in amplification of the signal. Because this arrangement permits the ND:YAG crystal to be end-pumped with pumping illumination, and because the length of the ND:YAG crystal may be substantially greater than the absorption length for the
20 crystal at the wavelength of the pumping illumination, virtually all of the pumping illumination may be absorbed within the ND:YAG crystal and used for amplification of the signal carried by the optical fiber.

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